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## 4.48 Water Framework Directive: Physico-chemical quality of surface waters

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| **Water Framework Directive: Physicochemical status of surface waters** | **Water Management** |
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| **Description and justification** | Water covers ca. 71 % of the Earth's surface but only 2.5 % of it is fresh, stored as groundwater and in glaciers. Water is vital for living organisms, and it enables a multitude of human activities such as agriculture, manufacturing and transportation of goods. Available water resources are being extensively used for a variety of purposes, and ensuring that the water quality is monitored and the degraded water bodies are enhanced is essential for protecting the water resources. Good ecological status of water bodies aggregates a number of indicators into an integrated indicator and it has been developed to determine and monitor the ecological |

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| | status of water bodies in Europe through the EU Water Framework Directive (WFD). The EU WFD (2000/60/EC) sets forth the framework for integrated management of surface waters and groundwater resources in the EU Member States, which are presented as River Basin Management Plans. |
| **Definition** | Physico-chemical quality of surface waters - rivers, lakes, transitional waters and coastal waters (rated high, good, moderate, poor, bad) |
| **Strengths and weaknesses** | + A comparable EU-wide applied assessment<br>- Requires arrangements on Member State-level |
| **Measurement procedure and tool** | The following procedure is based off the requirements set by the Water Framework Directive (2000/60/EC):<br>1. Characterise water bodies within a river basin area per Annex II:<br>a. Rivers, lakes, transitional waters or coastal waters — or artificial surface water bodies or heavily modified surface water bodies<br>2. Establish type-specific physicochemical reference conditions per Annex V<br>3. Identify significant anthropogenic pressures, and estimate point and diffuse source pollution in particular by substances listed under Annex VIII:<br>a. Organohalogen compounds and substances which may form such compounds in the aquatic environment<br>b. Organophosphorous compounds<br>c. Organotin compounds<br>d. Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine related functions in or via the aquatic environment<br>e. Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances<br>f. Cyanides<br>g. Metals and their compounds<br>h. Arsenic and its compounds<br>i. Biocides and plant protection products<br>j. Materials in suspension<br>k. Substances which contribute to eutrophication (in particular, nitrates and phosphates) |

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| | l. Substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.)<br>4. Establish monitoring of physicochemical status for surface waters:<br>a. Design of surveillance, operational and/or investigative monitoring per Annex V<br>b. Frequency of monitoring<br>c. Additional monitoring requirements for protected areas as listed under Annex IV<br>5. Present monitoring results as maps in accordance with Annex V<br>6. Classify physicochemical status of surface waters per Annex V: |
| **Scale of measurement** | River basin; Member State |
| **Data source** | |
| **Required data** | Reference conditions; Anthropogenic pressures, Point and diffuse pollution sources |
| **Data input type** | Quantitative |
| **Data collection frequency** | Frequency for surveillance monitoring period: |

| Quality element | Rivers | Lakes | Transitional | Coastal |
|---|---|---|---|---|
| Thermal conditions | 3 months | 3 months | 3 months | 3 months |
| Oxygenation | 3 months | 3 months | 3 months | 3 months |
| Salinity | 3 months | 3 months | 3 months | |
| Nutrient status | 3 months | 3 months | 3 months | 3 months |
| Acidification status | 3 months | 3 months | | |
| Other pollutants | 3 months | 3 months | 3 months | 3 months |
| Priority substances | 1 month | 1 month | 1 month | 1 month |

For operational monitoring, the frequency of monitoring required for any parameter shall be determined by Member States so as to provide sufficient data for a reliable assessment of the status of the relevant quality element. As

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| | a guideline, monitoring should take place at intervals not exceeding those indicated for surveillance monitoring. |
| **Level of expertise required** | Moderate to High |
| **Synergies with other indicators** | Indicators forming parts of the Member States' River Basin Management Plans: *Quantitative status of groundwater, Chemical status of groundwater, Ecological status of surface waters, Biological status of surface waters, Hydromorphological status of surface waters, Physicochemical status of surface waters* and *Ecological potential for heavily modified or artificial water bodies* |
| **Connection with SDGs** | SDG 3 Good health and well-being, SDG 6 Clean water and sanitation, SDG 11 Sustainable cities and communities, SDG 12 Responsible consumption and production, SDG 13 Climate action, SDG 14 Life below water |
| **Opportunities for participatory data collection** | No opportunities identified |
| **Additional information** | |
| **References** | European Parliament. (2000). *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy* http://data.europa.eu/eli/dir/2000/60/oj<br>European Commission. (2012). *Report from the Commission to the European Parliament and the Council on the Implementation of the Water Framework Directive (2000/60/EC). River Basin Management Plans*. |